FIG. 1

#### The nucleotide coding sequence (SEQ ID NO:1) and amino acid sequence (SEQ ID NO:2) of bovine lysozyme

atg aag gct ctc gtt att ctg ggg ttt ctc ttc ctt tct gtc gct V I L G F L F L S K A L gtc caa ggc aag gtc ttt gag aga tgt gag ctt gcc aga act ctg V F E R C E L A R G K aag aaa ctt gga ctg gac ggc tat aag gga gtc agc ctg gca aac G T D G Y K G V S J A N tqq ttq tqt ttq acc aaa tqq gaa agc agt tat aac aca aaa gct t. T K W Ε S S N I C aca aac tac aat cct agc agt gaa agc act gat tat ggg ata ttt N Y N P S S E S T D Y caq atc aac agc aaa tgg tgg tgt aat gat ggc aaa acc cct aat D G I N S K M = MС N qca qtt qac qqc tqt cat qta tcc tgc agc gaa tta atg gaa aat A V D G C H V S C S E L gac atc gct aaa gct gta gcg tgt gca aag cat att gtc agt gag C A K Н I D I A K A V A caa ggc att aca gcc tgg gtg gca tgg aaa agt cat tgt cga gac A = MV Α  $W_1$ K S H C R D G I T cat gac gtc agc agt tac gtt gag ggt tgc acc ctg taa E S S Y V G C

#### FIG. 2 (sheet 1 of 4)

# Nucleotide sequence of the plasmid p1044-BoLys

(extends from nucleotides 5767 – 6211 of the viral vector; the sequence encoding bovine lysozyme, including the stop codon, is inserted as a

GACGAAATCA CAGACAGCTA GCGTATCCAG CTGATGATGC GGGGGGAAAA ACATGCGAAC TCTAATATTC ACCTGGTTTT GCAATGGAAG TGGTTTCCCA TCCAAGGATT TCGATTCGAT TTTTACCTGC TGGGATGAGA GCATTAGAGA GACATTAGGA CTGACTCTCA ACCTCAAGAG TCGTCCTATT ATTGTGTACA GTCAAGATCC TIGGATGITG CATCIAGGAA GIGGITAAIC AAACCAACGG TGCTGCATGC GCGGCACTCT GATGTTTTT TIACTATITA CAATIACAAT GGCATACACA AGACGCTTAT TGCTACCCGG GATCTTTAGA ACTGGAATAT GCTAGAGAGA TACTTTCCAG CIGCIICIIG AAGAIICAIG CGICAAIIIG TIAATTACTG TCATAGTTAT CAGAGTTAAT AGTCAATTAC AGTCTTAGTG GTCCATGACG ATTGGTAGTT GATGAGCTCG GTCGAATCTC AGCGTCGTCT TTACGACACA TGAGTTCGGG CTTCGTCGAA CCAGCATGTG GGCAGGCGAC ATTCGATGTT TCATCCGGAA ATATGTACAC GTTTTATACT GCCIGCGCTT TGAGAGCGGT AGGGACGAGC ATAGTGAGCA TACAATCCTT AAACGGTGTG AGTCTGACAA TCATGAGCAA CTGCTGCGGT ACCTTTCTAG TCTGTCACAA TACCAGCCGA TTTTAGTCAC ATTCATCATC CGCGCAAGGA ATGTTTTGTC TTATCAGAGT CIGIGGACAT CAGAAGGTGC TTGCTGGAGA TICGIAAGCA GATCTAGCAA ATGAAGGAGT CTCCTTGAGG GCATCACTAT AGCGAGGAGC GGTGGATTGC CATCTGTTCA ATTGAACTAT GAAGACGCTG ATATATGACA GAGAGTACTC AAAAGTGTAG AGTAAGAGGA ACATACGCAA AAATCTTTGT CTCGGTTCGA AACAGGAAAC TACAAGGCCT GTGTTAAGGG ATAGICGCGG GAGAAGGCTT TIAGCIGGIC GATTCGTTAA GTTTGGAGTC GTATITITAC AACAAITACC AACAACAACA AACAACAGAC AACAITACAA GAGGCTCTTG AGAGGTTTAC CTTGGTCAAT AAAAGTAATA TTCGCTTGCA GAAAGACAGT AGAAATTCCT TTTGGAGACT GGATGTGGAC CAAGTTTAGT AGAATTATCG AGCGAAGGTT TTTTGCATCG GCTACACAGC CTCCGAGAAC TTTTGCATCA TGTGGCCCAT CGAGAGAATC GAAAGCTCTT AGTGACTGAG ACAGGATCAA AGAGTTACAA GGCGACGGCA TAGCCTGGTA PacI-XhoI fragment and is shown in lower case letters, underscored GACCTTGAAA CCCGTCAAAA AACACGCAAA ATGCCGTGCA GAAACAACTC TGAACTTTTC TAGGCGGGAA ACGAAGGCCA ACAGATACGC CCTCTAATAG CCGTGAAAGA ATGCACTTTC CAATGACGGC CGCTAGCTTT TGGCCAGAGG AGTTTCATAT ACTTTATCGA ATGCCATTGC TGTACAAAGG TGTGCAACAG CATACCAGGC GGTCCGAATG ACGACAGATT CTTTCCACTT TGACCTTTTC TCGACATTTC TACTGATTAG ACTGTCCGAG AGGCCCAAGG ACTTATGACA ATCATGCGGC GAAGCATTTG GGCAGAGTGT TGCTATGCCG GGAGACAAGT ACTCTTGCAA GTACCATTAT AAGGATGACT GCATTTCCCT GTGACCTTCC GTGATGTACA GCGAATGTTG AAGGGTTCGA TCTTTAGAGC CAAATGAAAA TACTTCCCGG ACTITICITI CACATTCGAA GIGACAGCGA GAAGTTGACC TTTGCTGGAC ICAAAGATAC AGCIGCTATI TCGTGACCGC TACATTTTAT CGGATCATTG TGTCCATACG TICGCGCGAI CATTAACGGT TGCCGTTCTA CGTTCGAGAC CTTCCAAAAG TAGAATAGAT TTACAAAAAG TATGGTCATC AGTGCTTAAC TGATCTATAT AGAAACGGAA CCAATCTTTG ACCTACTGAG ACCGTCCATG GGAGATAGAG TAAAGTTCAG GCAGCAATCA GTGCAAAACT GTTTGGGAAC CCACATCAGC AGITIAACGC AATTCCAAAT AAATTCCCTA CCAACCTGGA CAGTCCCCAA ATCAGCCGAT ACGCGTGTTT AAATGAGGGA CGAGGGTAAT ATACTAAGCT AGAAGATGGA CCCAGATGTG CATTTGAACG AAGTTGAAGA CTAAGAACGA CGGGTCCGAT TGAGGAAAAA TTAAGTATGT GTAAGTTTTC ACGCATGGCA TCGTGTTCAC TITCGCIGGC TCAGGGTGCC

## The state of the s

#### FIG. 2 (sheet 2 of 4)

ATTGAAAATA TGTCTTGGAG CTGGATATAT TTGGGAGAAG TCAAAGAAAG AGCGGGACG GCCTTTTGCG GAAGCAAAAC CTAAAGTTGA TCGTTGAACA TGTTTATAAA AGTCTGGTGA AATGAGTCAT TGTCAGGGGT GAACCTTCTT AAAGGAGTTA AGCTTAITGA TAGTGGATAC GTCTGTTTAG CCGGTTTGGT CGTCACGGGC SAGTGGAACT TGCCTGACAA TTGCAGAGGA GGTGTGAGCG TGTGTCTGGT GGACAAAAGG ATGGAAAGAG CCGACGAGGC CATTCTCGGA TTTTACTATG GTCAAAGATT GAAATGCCAC GGATTTGCCA GCAGTTGATC ATTGTGTACC AGATTTTTGT GTTTATCGAC ACTACTCTCC GTTTCGCAGG AAAGAAGCIC TTAACCCCTA CAAGTACTAC ACTGTTGTTA ACACAATAGC TTCAGTAGAG ATTGATGAAG CAGCAGATTC CTGCTTCGAA TCCAGGGTTA ATTGTGGCCA CTGACAAAAATGGAGAAGAT CTTACCGTCG ATGTTTACCC CTGTAAAGAG TGTTATGTGT TCCAAAGTTG ATAAAATAAT GGTTCATGAG GTGGTGACAT TTCATTGAAT CATCATTGAT TTTGCAGACG TGATTCGAGC CGAAGACTTC AATCAAAGGA AGTATITGIC TGATAAAGIT CITTITAGAA GITTGITIAI AGATGGCICT AGITGITAAA GGAAAAGIGA ATAICAATGA CGATGCAGGA AACGGCGGCA TGTTTCTTTG GTGGAATTTT TTACGATCCC TGTTGCTGTT GACACGCAGA CCAATCGGAT ACTAGTTAGG TGATATGCAG TGGAATATGA TGAGCAGGGT TCTGCGCAGA AGAAATTCTT TAAAAAGTCT CTCAGGGATT GAGGTTATTC CGGAGACACA GCATCTGGTA TGGAGAAAAT ITICCAAAGG GIIGIGAGII ICCGGAIGIG CAACACICCG CGAAICITAI ACAGTATGGA TACTTTTGCG GAAGATATGT AATACATCAC GACAGAGGAT GCATTGTGTA TGGTGCTAAA CACATCAAGG ATTGGGAACA CTTGGAGGAG TTCAGAAGGT CTCTTTGTGA CAGGTTCGTT TGACTGACAT CTATGGTACG AGTTGTCTGG CAAATAAAAA TGCCGATGGA GATTGGGTTT TGACTTTTAC CTGATGTTTC TTGATTTTGT GGACACTICA ATCCAAACGG AGTACCCGGC TGGACAGTGT AACTCAGAAC GAAAAACCAA GTGCGAATTC CTTCTTCGGT CCIGITCGCI GTGATATTTC GTCAGTTCAA CATATGTTTA ACGAGGTGGA TGTATAAGGT ITGCIGCÁIG ITIGGCCICG AIGCIICCGA GAAAAGCAGG AACAGGTAAC AATAGGCCAG CTCGCAGATT TTACACACAG TTGGACGACG CTGTATGGGA GGTTCATAAG ACCGCCCCTC GAAGTATCAT GIGGCGCTTT TCAAGGCACA AACGCACCCG GCTTAAAGAA AAAAGAAAAC TGAGCTTACC AGGCAATTAC CGGAGATCTC GACAGTCATG AGAATACGAG ATCTGGCGAA ATAAAAACTT GACATGGCGA CCGGGCTGTG TIGGAAGIIG GTCATGAGCA GGCAAGATCC GAGACATACT TIGITAGATA TGTTGCAGCG CCAAAGACTG ACCATGAGGT CCACTAATAC CGCGGAAATG ATCAGAAGAC AGCACACGCT TGCGAAATTG TGATGCTGTT AAGAAACTIT TACCGCAGGT CACATGTTTT GGTCGCATTG TAGCTCGTAC GGACGGAGTT TCATGATGAA TTTTGGGAAA ACCCTTGCAT AGTGCAAGGC TCAAATCAAA TGTTTATTCC GATGTCATTG TTTGCCAAA TGAGGGCTTT TAGAGAAACT CCAATCTTTT TGAATAATTT ATATICGGCC CGTIGITIAG GCGCAGATTG AGGATTTCTT CGATCTCAAA CTGTGCATGA CGCCTAAGGA CGATGATTAA ATAGTTATTT GCACAACCCA AACAAAGTT CAAATCTCAG AATGAATTCC ACTGTGCAGT TCAAGGATTA ACCCGCCCA CATTATCTGA ACAGGAGATA CCCACGCGAG TTCTTGTGGC CTGAGTCTGT TIGITCTIGI GGAAGCAAGC TGTGTTAATT GGATTCCCGT ATTAGAGATC TCTGTTGCTG ACTATTGGAA AATTTAGTGG AAGTTTTTG AGGGCATAGA AAGACCACCC CATIGGAAAC ACTGTGATCA GTTGTTGAAA TTAGTACCTG GTTGATTCTT GTGATCAATC GATGTTCACA GGAGACAGCC TTCAAAGGTT AGCACCATGA AGCGCAAAGG GCTGTTAGCT TGACTCGGTG TATGTCTAAG TAGATGGTTA GATCAATGCA AAAGACACCA TCTGCTGTAC CCCAGGCAAC GGTTGTAGAT CATGATTAAA CCAAGAGTCA TGCATGGGGT AGTTAGTATC GCATGTCAGT AGATCTAATT CGTTAAAACC GCATACTGGT CGATGTCACA CGGAGCCGCC AGGGTATTCA CATCATTGCA GAGAAGAGTA TAGAGITICA GCCAGACTGG TTTCACAAG TCTCGAAACT TGCTTTCAAG GCATATTGGA ATTCAAAAAA CAAAATACGA TTTGGAAACA TCACGACGIT TGTTTAAAAA ATTGTGCGTA AATTACAGAT ATAAGTGTCT CTGCATCTTT GTGACGATAG GCGATGATTG ATTTGATGA CGAAGGACAA GGTTGATGTT CATACATCAA GITGICCAGC AGATGGTCGG CACCGGTCTC TGGATCCTTT AGTCTCTCAA AGTACAGACA ACGGAGAACC

#### FIG. 2 (sheet 3 of 4)

AATCGATGAT GATTCGGAGG CTACTGTCGC CGAATCGGAT TCGTTTTAAA TAGATCTTAC AGTATCACTA CTCCATCTCA GTTCGTGTTC TTGTCATTAA TATTGTTTAT CGTTGATGAG GAAAAATAGT GAAAAACGTC AGGICGIICC CAATIAIGCI AIAACCACCC AGGACGCGAI TGTCGGTGTG CAGAAGAAGT TCCGCAAAGG AGAATAATTT ACGIGAGAGA CGGAGGCCC AIGGAACTIA TIAAGGATIT IGGGGGAAIG AGIITIAAAA CIGGAGITIG TICGATCICG AACCGGAAAA AAGAGIGAIG CGGGTTTCTG TCCGCTTTCT ICTIACTACA CAGCAGCIGC AAAGAAAAGA ITICAGIICA TAGAAATGTG AAGATGTCAG TTTGAGAGAG AAGATTACAA TATAGAAATG CTTGCAAAGT GAACAAGAAC GTCGATCAGG TAAAATTAGG TAGTTAATAT ATGTCCCTAT GGTCAGTGCC TTCATGGAAG AGAAATAATA TGGCAAGTTT AGTAGTGATC TTAAAA

atg aag got oto gtt att otg ggg ttt otc ttc ott tot gto got gto caa ggo aag gto ttt gag aga tgt gag ctt gcc aga act ctg aag aaa ctt gga ctg gac ggc tat aag gga gtc agc ctg gca aac tgg ttg tgt ttg acc aaa tgg gaa agc agt tat aac aca aaa gct aca aac tac aat cct agc agt gaa agc act gat tat ggg ata ttt cag atc aac agc aaa tgg tgg tgt aat gat ggc aaa acc cct aat gca gtt gac ggc tgt cat gta tcc tgc agc gaa tta atg gaa aat gac atc gct aaa gct gta gcg tgt gca aag cat att gtc agt gag caa ggc att aca gcc tgg gtg gca tgg aaa agt cat tgt cga gac cat gac gtc agc agt tac gtt gag ggt tgc acc ctg taa

CTCGAGGGGT AGTCAAGATG CATAATAAAT AACGGATTGT GTCCGTAATC ACACGTGGTG CGTACGATAA CGCATAGTGT TTTTCCCTCC ACTTAAATCG AAGGGTTGTG TCTTGGATCG CGCGGGTCAA ATGTATATGG TTCATATACA TCCGCAGGCA CGTAATAAAG CGAGGGGTTC TTTAATCAAT GTGTACAAAT TAGTATGACA CTTCGATACT TGCGACTGTA TGCTAGTGGA GGGTGGCTGA GTGTATACTG CGTCCACTTA AGGTTCGAAT GCAGGCATGC GAAGCATAAA TCGCTCACTG ACTCGCTGCG TCGAGTACGT AACAACGGAG ATACGAGCCG AACCTGTGCC TATTAAATAG GGGTAGACGA GCTTTGAGAC TTAAAATTCA CCATGTGATG AGTGGTTGTT AAACCTGGCT CAGTCGGGAA TGATCAATCT AAAGGTTTGA AAGTTGAGGA AATTGAGGAT AATGTAAGTG ATGACGAGTC TATCGCGTCA GCGACTCAGA GGTTTGCGTA TTGGGCGCTC TTCCGCTTCC ATCACGGCGT AATCAAGCAA CACTGAAGAC AACAGTTAAA CAAAATCAGC TATGGCGTAA TCCACACAAC CCTGTGCAGC GATGCCTGGA CGTGAGGACG GCCCGCTTTC ATCTGGATCC TTATGCAGAT GCAATTTGCG TGATCCGTTG CCCGCACCGA ATACTACTGA AATCGTTAAC TGGCATGTTC CGCTCACAAT TGCGCTCACT AAAATAAAGT TGGCTGATAC TATACTGTGG CTGATGAGTC GAGATTTCCT TAAGTTCCGC CAGTCCAACA ATTCGACGCT TTCGTGGAAC AAATTCAGGG TGTGATGGTG AATTGTTATC TTAATTGCGT CGATTGTCAT GTTTTCCGGG TTTGTTTACT GCTAGGACAA TATAGATATA AATGAACTGG TTAAATATAA TGAAGACTTA TCCTGTGTGA GGGGAGAGGC AGTTAAACCA ACCCGGATGT CTAACTCACA CTATIGITGI AATGAGTGAG TAATGAATCG GCCAACGCGC CAATCAACTC TCCGAGCCAA ACCAGITICA AACGCAACAA TTTCTATGTG TAATAGAGGT TGATAATCAA TAATTTGGCT GGCTACTTAG GTTCGTCCAC GAAAAGTCGC TGGATCCAAC CGGCCCAGGT CatAGCTGTT CTGCATCGGA TGGGGTGCCT CTTCAATCAA CCACAACTCC TAATcatggt AGCAGIGGIT TAAAACAACG TIGICATAIC CCGCGGGTAG TAGTGGTAAG ATGCCTTATA GCATTGGGTA CCAGCTGCAT GGGTCGAGGT AGAAATAGAA GTGAGATTTC GCTATAAGGG CTTGTCTGGA TACCAAAATC TGGTATGGCG AAAATAACGA CCTCCCCTAA AAGCTTGGCG GTGTAAAGCC

### FIGURE 2 (sheet 4 of 4)

က် SP-2 Replicase subunits SP-E SP-1

Fig. 3.

10-20% Tris-Glycine SDS PAGE gel



- Marker
  (+) BoLys 1μg
  (+) BoLys 2 μ g
  (+) BoLys 5 μ g
  Nb-1 GJ 2 μ I
  Nb-2 GJ 2 μ I
  Nb-3 GJ 2 μ I

TMV coat protein

20 kDa

14 kD

bolys

Fig. 4

#### 14% Tris-Glycine SDS-PAGE gel

1. Marker

2. (+) Hen EW lys 5  $\mu$ g 3. (+) BoLys - 1  $\mu$  g 4. (+) Boys - 2  $\mu$  g 5. (+) BoLys - 3.5  $\mu$  g 6. (+) BoLys - 5  $\mu$  g

6. (+) BoLys -  $5 \mu g$ 7. (+) BoLys -  $7 \mu g$ 

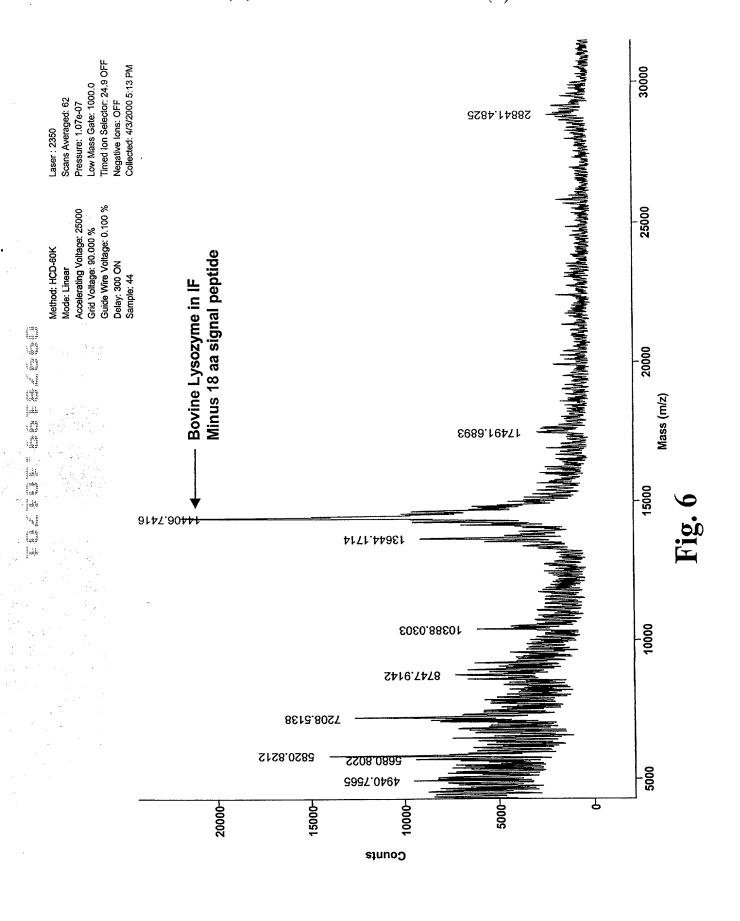
8. 1051500 IF crude - 1  $\mu$  I 9. 1051500 IF crude - 5  $\mu$  I 10. 1051100 IF crude - 1  $\mu$  I 11. 1051100 IF crude - 5  $\mu$  I 12. Marker 12

TMV coat protein

20 kD

bolys

Fig. 5



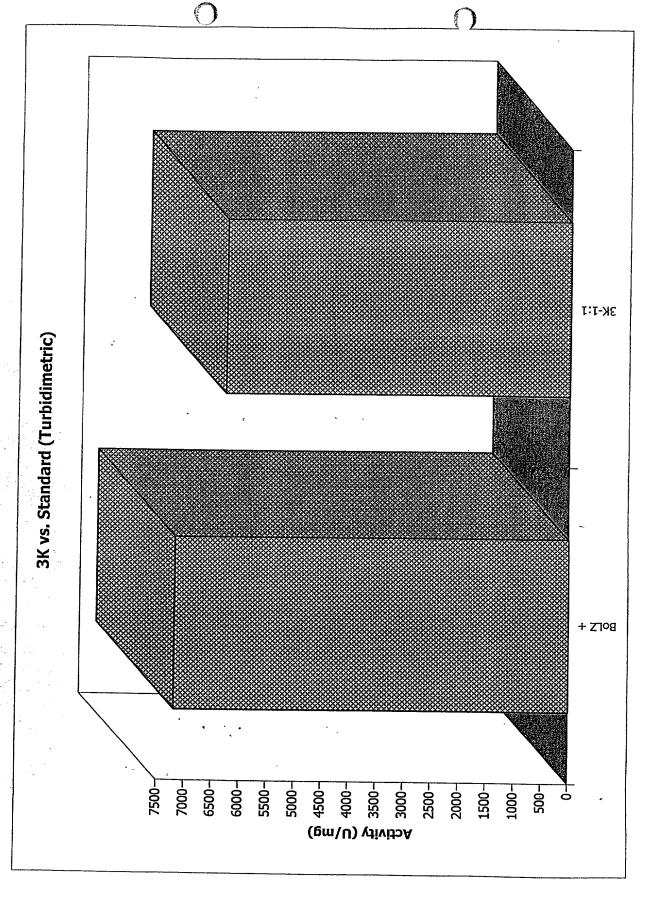


Fig. 7

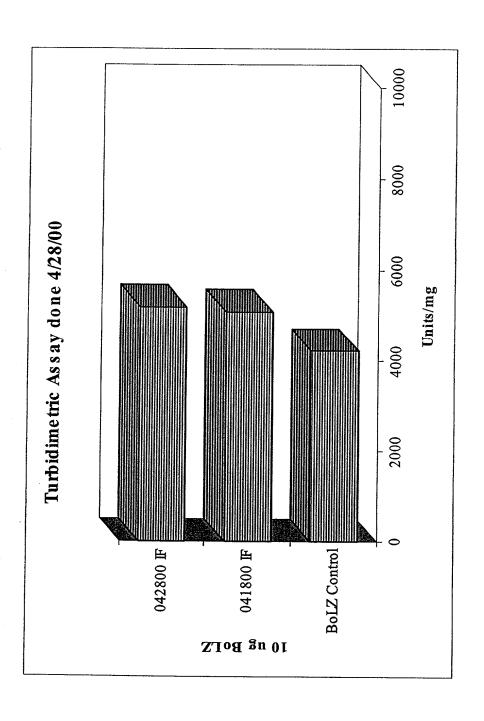


Fig. &

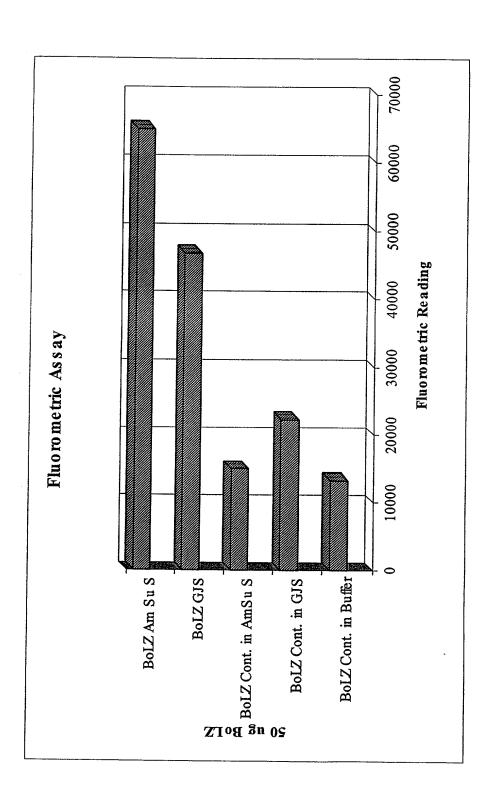


Fig. 9

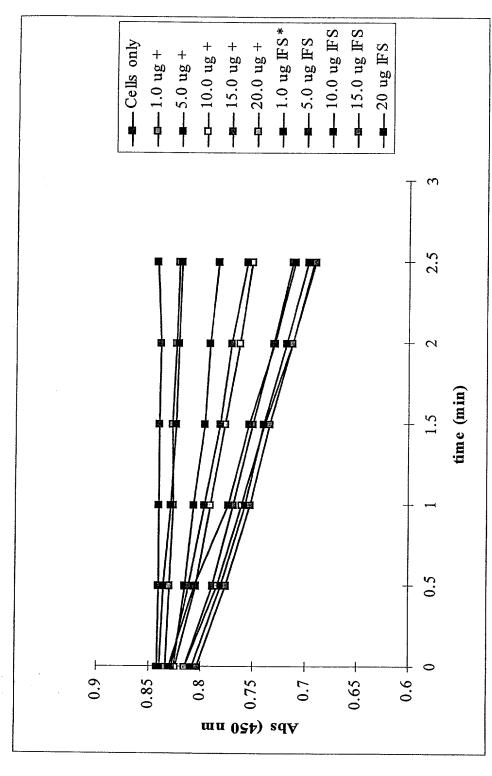


Fig. 10